

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (cancelled)

2. (currently amended) The ~~surface treating method of substrate according to claim 1~~ method for treating a substrate according to claim 21, wherein the process gas contains raw material components, and a film made from said components is formed on the substrate.

3. (currently amended) The ~~surface treating method of substrate according to claim 1~~ method for treating a substrate according to claim 21, wherein the raw material components are carbon and hydrogen and a diamond-like carbon film is formed on the substrate.

4. (currently amended) The ~~surface treating method of substrate according to claim 1~~ method for treating a substrate according to claim 21, wherein the process gas contains a component reactive with the substrate material and a film resulting from the reaction between said component and the substrate is formed on the substrate.

5. (currently amended) The ~~surface treating method of substrate~~
method for treating a substrate according to claim 4, wherein the
component reactive with the substrate material is any one of
oxygen, nitrogen or carbon, and any one of oxide film, nitride
film or carbonized film is formed.

6. (currently amended) The ~~surface treating method of substrate~~
~~according to claim 1~~ method for treating a substrate according to
claim 21, wherein the process gas contains a non-reactive
component and the collision of said component results in the
flattening of the substrate surface.

7. (currently amended) The ~~surface treating method of substrate~~
~~according to claim 1~~ method for treating a substrate according to
claim 21, wherein a mesh electrode placed in the opposite
direction to the substrate is provided within the process
chamber, and a bias voltage negative on the substrate side is
applied between said electrode and the substrate.

8. (currently amended) The ~~surface treating method of substrate~~
~~according to claim 1~~ method for treating a substrate according to
claim 21, wherein the pressure within the process chamber is
maintained between 0.01 ~ 0.5 atmospheric pressure.

9. **(currently amended)** The ~~surface treating method of substrate according to claim 1~~ method for treating a substrate according to claim 21, wherein ultraviolet having a photon energy of 4 ~ 9 eV is irradiated.

10. **(currently amended)** The ~~surface treating method of substrate according to claim 1~~ method for treating a substrate according to claim 21, wherein a discharge-type lamp such as low-pressure mercury lamp is used as a light source of ultraviolet.

11. **(currently amended)** The method for treating a substrate ~~surface treating method of substrate~~ according to claim 2, wherein a mesh electrode placed in the opposite direction to the substrate is provided within the process chamber, and a bias voltage negative on the substrate side is applied between said electrode and the substrate.

12. **(currently amended)** The method for treating a substrate ~~surface treating method of substrate~~ according to claim 3, wherein a mesh electrode placed in the opposite direction to the substrate is provided within the process chamber, and a bias voltage negative on the substrate side is applied between said electrode and the substrate.

13. (currently amended) The method for treating a substrate
~~surface treating method of substrate~~ according to claim 4,
wherein a mesh electrode placed in the opposite direction to the
substrate is provided within the process chamber, and a bias
voltage negative on the substrate side is applied between said
electrode and the substrate.

14. (currently amended) The method for treating a substrate
~~surface treating method of substrate~~ according to claim 5,
wherein a mesh electrode placed in the opposite direction to the
substrate is provided within the process chamber, and a bias
voltage negative on the substrate side is applied between said
electrode and the substrate.

15. (currently amended) The method for treating a substrate
~~surface treating method of substrate~~ according to claim 6,
wherein a mesh electrode placed in the opposite direction to the
substrate is provided within the process chamber, and a bias
voltage negative on the substrate side is applied between said
electrode and the substrate.

16. (currently amended) The method for treating a substrate
~~surface treating method of substrate~~ according to claim 2,
wherein the pressure within the process chamber is maintained
between 0.01 ~ 0.5 atmospheric pressure.

17. **(currently amended)** The method for treating a substrate
~~surface treating method of substrate~~ according to claim 3,
wherein the pressure within the process chamber is maintained
between 0.01 ~ 0.5 atmospheric pressure.

18. **(currently amended)** The method for treating a substrate
~~surface treating method of substrate~~ according to claim 4,
wherein the pressure within the process chamber is maintained
between 0.01 ~ 0.5 atmospheric pressure.

19. **(currently amended)** The method for treating a substrate
~~surface treating method of substrate~~ according to claim 5,
wherein the pressure within the process chamber is maintained
between 0.01 ~ 0.5 atmospheric pressure.

20. **(currently amended)** The method for treating a substrate
~~surface treating method of substrate~~ according to claim 7,
wherein the pressure within the process chamber is maintained
between 0.01 ~ 0.5 atmospheric pressure.

21. **(new)** A method for treating a substrate, comprising:
 placing an electrically conductive substrate in a
treating container maintained at a pressure of 0.001 to 1
atmospheric pressure;
 supplying a process gas into the treating container;

irradiating an ultraviolet ray having a photon energy of 3 to 10 eV to a surface of the substrate from a light source housed in the treating container having a light output window so as to emit electrons from the surface of the substrate;

applying a negative bias voltage to the substrate and accelerating the emitted electrons;

producing a dense plasma in a vicinity of the surface of the substrate due to repeated collisions of the accelerated electrons with the process gas under a pressure within the treating container; and

treating the surface of the substrate with the plasma.

22. (new) A method for treating a substrate, comprising:

placing an electrically conductive substrate in a treating container maintained at a pressure of 0.001 to 1 atmospheric pressure;

supplying a process gas into the treating container;

irradiating an ultraviolet ray having a photon energy of 3 to 10 eV to a surface of the substrate from a light source housed in the treating container having a light output window;

applying a negative bias voltage to the substrate with respect to an electrode, the electrode having a plurality of openings through which an ultraviolet ray is allowed to pass and arranged between the light source and the substrate in a manner facing the substrate;

whereby a dense plasma is produced in a region close to the surface of the substrate and between the substrate and the electrode under a pressure within the treating container; and
treating the surface of the substrate with the plasma.

23. (new) A method for treating a substrate, comprising:

placing an electrically conductive substrate in a treating container maintained at a pressure of 0.001 to 1 atmospheric pressure;

supplying a process gas into the treating container;

irradiating an ultraviolet ray having a photon energy of 3 to 10 eV to a surface of the substrate from a light source housed in the treating container having a light output window so as to emit electrons from the surface of the substrate;

applying a negative bias voltage to the substrate with respect to an electrode, the electrode having a plurality of openings through which an ultraviolet ray is allowed to pass and arranged between the light source and the substrate in a manner facing the substrate, and accelerating the emitted electrons;

producing a dense plasma in a region close to the surface of the substrate and between the substrate and the electrode due to repeated collisions of the accelerated electrons with the process gas under a pressure within the treating container; and

treating the surface of the substrate with the plasma.

24. (new) An apparatus for treating a substrate, the apparatus comprising:

(a) a container adapted to treat a substrate, said treating container having an inlet for a process gas and is adapted to maintain an internal pressure of 0.001 to 1 atmospheric pressure;

(b) a light source having a light output window, the light source being housed in the treating container and is adapted to irradiate an ultraviolet ray having a photon energy of 3 to 10 eV to a surface of a substrate;

(c) an electrode arranged between the light source and the substrate in a manner facing the substrate and having a plurality of openings through which an ultraviolet ray is allowed to pass; and

(d) a power source for applying a negative bias voltage to the substrate with respect to the electrode,

wherein the apparatus is adapted to perform the method of claim 21 that treats a surface of an electrically conductive substrate with a dense plasma produced in a vicinity of the surface of the substrate.